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PATENT COOPERATION TREATY

PCT

NOTIFICATION OF ELECTION

(PCT Rule 61.2)

From the INTERNATIONAL BUREAU

To:

Commissioner
 US Department of Commerce
 United States Patent and Trademark
 Office, PCT
 2011 South Clark Place Room
 CP2/5C24
 Arlington, VA 22202
 ETATS-UNIS D'AMERIQUE

in its capacity as elected Office

Date of mailing (day/month/year) 17 April 2001 (17.04.01)	
International application No. PCT/US99/30775	Applicant's or agent's file reference RCA89647
International filing date (day/month/year) 22 December 1999 (22.12.99)	Priority date (day/month/year) 15 July 1999 (15.07.99)
Applicant WHITE, David, Glen et al	

1. The designated Office is hereby notified of its election made:

☒ in the demand filed with the International Preliminary Examining Authority on:

12 February 2001 (12.02.01)

☐ in a notice effecting later election filed with the International Bureau on:2. The election ☒ was☐ was not

made before the expiration of 19 months from the priority date or, where Rule 32 applies, within the time limit under Rule 32.2(b).

The International Bureau of WIPO 34, chemin des Colombettes 1211 Geneva 20, Switzerland Facsimile No.: (41-22) 740.14.35	Authorized officer R. Forax Telephone No.: (41-22) 338.83.38
---	--

INTERNATIONAL SEARCH REPORT

International Application No

PCT/US 99/30775

A. CLASSIFICATION OF SUBJECT MATTER

IPC 7 G06F13/40 H04N5/21

According to International Patent Classification (IPC) or to both national classification and IPC

B. FIELDS SEARCHED

Minimum documentation searched (classification system followed by classification symbols)

IPC 7 G06F H04N

Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched

Electronic data base consulted during the international search (name of data base and, where practical, search terms used)

C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category *	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
Y	PATENT ABSTRACTS OF JAPAN vol. 009, no. 314 (P-412), 10 December 1985 (1985-12-10) & JP 60 144857 A (NIPPON DENKI KK), 31 July 1985 (1985-07-31) abstract	1,8
Y	WO 99 31598 A (TESTIN WILLIAM JOHN ;TULTS JURI (US); THOMSON CONSUMER ELECTRONICS) 24 June 1999 (1999-06-24) the whole document	1,8
A		3,4,6, 9-11
A	EP 0 675 448 A (CASIO COMPUTER CO LTD) 4 October 1995 (1995-10-04)	
A	EP 0 195 163 A (OLIVETTI & CO SPA) 24 September 1986 (1986-09-24)	

☐ Further documents are listed in the continuation of box C.

☒ Patent family members are listed in annex.

* Special categories of cited documents :

- *A* document defining the general state of the art which is not considered to be of particular relevance
- *E* earlier document but published on or after the international filing date
- *L* document which may throw doubt on priority claim(s) or which is cited to establish the publication date of another citation or other special reason (as specified)
- *O* document relating to an oral disclosure, use, exhibition or other means
- *P* document published prior to the international filing date but later than the priority date claimed

- *T* later document published after the international filing date or priority date and not in conflict with the application but cited to understand the principle or theory underlying the invention
- *X* document of particular relevance; the claimed invention cannot be considered novel or cannot be considered to involve an inventive step when the document is taken alone
- *Y* document of particular relevance; the claimed invention cannot be considered to involve an inventive step when the document is combined with one or more other such documents, such combination being obvious to a person skilled in the art.
- *Z* document member of the same patent family

Date of the actual completion of the international search

13 April 2000

Date of mailing of the international search report

19/04/2000

Name and mailing address of the ISA

European Patent Office, P.B. 2818 Patentlaan 2
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Fax: (+31-70) 340-3016

Authorized officer

Yvonnet, J

INTERNATIONAL SEARCH REPORT

Information on patent family members

International Application No

PCT/US 99/30775

Patent document cited in search report		Publication date	Patent family member(s)	Publication date
JP 60144857	A	31-07-1985	NONE	
WO 9931598	A	24-06-1999	AU 5530598 A	05-07-1999
EP 0675448	A	04-10-1995	JP 7271490 A	20-10-1995
			CN 1115441 A	24-01-1996
			KR 157142 B	16-11-1998
			US 5729764 A	17-03-1998
EP 0195163	A	24-09-1986	US 4713779 A	15-12-1987
			CN 1010617 B	28-11-1990
			DE 3585229 A	27-02-1992
			JP 2116550 C	06-12-1996
			JP 8020859 B	04-03-1996
			JP 61204778 A	10-09-1986

PCT

INTERNATIONAL SEARCH REPORT

(PCT Article 18 and Rules 43 and 44)

Applicant's or agent's file reference RCA89647	FOR FURTHER ACTION see Notification of Transmittal of International Search Report (Form PCT/ISA/220) as well as, where applicable, item 5 below.	
International application No. PCT/US 99/ 30775	International filing date (day/month/year) 22/12/1999	(Earliest) Priority Date (day/month/year) 15/07/1999
Applicant THOMSON LICENSING S.A. et al.		

This International Search Report has been prepared by this International Searching Authority and is transmitted to the applicant according to Article 18. A copy is being transmitted to the International Bureau.

This International Search Report consists of a total of 2 sheets.

☒ It is also accompanied by a copy of each prior art document cited in this report.

1. Basis of the report

- a. With regard to the **language**, the international search was carried out on the basis of the international application in the language in which it was filed, unless otherwise indicated under this item.

☐ the international search was carried out on the basis of a translation of the international application furnished to this Authority (Rule 23.1(b)).

- b. With regard to any **nucleotide and/or amino acid sequence** disclosed in the international application, the international search was carried out on the basis of the sequence listing :

☐ contained in the international application in written form.

☐ filed together with the international application in computer readable form.

☐ furnished subsequently to this Authority in written form.

☐ furnished subsequently to this Authority in computer readable form.

☐ the statement that the subsequently furnished written sequence listing does not go beyond the disclosure in the international application as filed has been furnished.

☐ the statement that the information recorded in computer readable form is identical to the written sequence listing has been furnished

2. ☐ **Certain claims were found unsearchable** (See Box I).

3. ☐ **Unity of invention is lacking** (see Box II).

4. With regard to the **title**,

☒ the text is approved as submitted by the applicant.

☐ the text has been established by this Authority to read as follows:

5. With regard to the **abstract**,

☒ the text is approved as submitted by the applicant.

☐ the text has been established, according to Rule 38.2(b), by this Authority as it appears in Box III. The applicant may, within one month from the date of mailing of this international search report, submit comments to this Authority.

6. The figure of the **drawings** to be published with the abstract is Figure No.

☒ as suggested by the applicant.

☐ because the applicant failed to suggest a figure.

☐ because this figure better characterizes the invention.

1A

☐ None of the figures.

INTERNATIONAL SEARCH REPORT

International Application No

PCT/JS 99/30775

A. CLASSIFICATION OF SUBJECT MATTER

IPC 7 G06F13/40 H04N5/21

According to International Patent Classification (IPC) or to both national classification and IPC

B. FIELDS SEARCHED

Minimum documentation searched (classification system followed by classification symbols)

IPC 7 G06F H04N

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Electronic data base consulted during the international search (name of data base and, where practical, search terms used)

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Y	WO 99 31598 A (TESTIN WILLIAM JOHN ;TULTS JURI (US); THOMSON CONSUMER ELECTRONICS) 24 June 1999 (1999-06-24)	1,8
A	the whole document	3,4,6, 9-11
A	---	
A	EP 0 675 448 A (CASIO COMPUTER CO LTD) 4 October 1995 (1995-10-04)	
A	---	
A	EP 0 195 163 A (OLIVETTI & CO SPA) 24 September 1986 (1986-09-24)	

☐ Further documents are listed in the continuation of box C.☒ Patent family members are listed in annex.

* Special categories of cited documents :

- "A" document defining the general state of the art which is not considered to be of particular relevance
- "E" earlier document but published on or after the international filing date
- "L" document which may throw doubts on priority claim(s) or which is cited to establish the publication date of another citation or other special reason (as specified)
- "O" document referring to an oral disclosure, use, exhibition or other means
- "P" document published prior to the international filing date but later than the priority date claimed

- "T" later document published after the international filing date or priority date and not in conflict with the application but cited to understand the principle or theory underlying the invention
- "X" document of particular relevance; the claimed invention cannot be considered novel or cannot be considered to involve an inventive step when the document is taken alone
- "Y" document of particular relevance; the claimed invention cannot be considered to involve an inventive step when the document is combined with one or more other such documents, such combination being obvious to a person skilled in the art.
- "&" document member of the same patent family

Date of the actual completion of the international search

13 April 2000

Date of mailing of the international search report

19/04/2000

Name and mailing address of the ISA

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Fax: (+31-70) 340-3016

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Yvonnet, J

INTERNATIONAL SEARCH REPORT

Information on patent family members

International Application No

PCT/US 99/30775

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EP 0675448 A	04-10-1995	JP 7271490 A	20-10-1995
		CN 1115441 A	24-01-1996
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		US 5729764 A	17-03-1998
EP 0195163 A	24-09-1986	US 4713779 A	15-12-1987
		CN 1010617 B	28-11-1990
		DE 3585229 A	27-02-1992
		JP 2116550 C	06-12-1996
		JP 8020859 B	04-03-1996
		JP 61204778 A	10-09-1986



REC'D 16 OCT 2001

WIPO

PCT

INTERNATIONAL PRELIMINARY EXAMINATION REPORT

(PCT Article 36 and Rule 70)

Applicant's or agent's file reference RCA89647		FOR FURTHER ACTION See Notification of Transmittal of International Preliminary Examination Report (Form PCT/IPEA/416)
International application No. PCT/US99/30775	International filing date (day/month/year) 22/12/1999	Priority date (day/month/year) 15/07/1999
International Patent Classification (IPC) or national classification and IPC H04N5/44		
Applicant THOMSON LICENSING S.A. et al.		
<p>1. This international preliminary examination report has been prepared by this International Preliminary Examining Authority and is transmitted to the applicant according to Article 36.</p> <p>2. This REPORT consists of a total of 4 sheets, including this cover sheet.</p> <p><input checked="" type="checkbox"/> This report is also accompanied by ANNEXES, i.e. sheets of the description, claims and/or drawings which have been amended and are the basis for this report and/or sheets containing rectifications made before this Authority (see Rule 70.16 and Section 607 of the Administrative Instructions under the PCT).</p> <p>These annexes consist of a total of 6 sheets.</p>		
<p>3. This report contains indications relating to the following items:</p> <ul style="list-style-type: none">I <input checked="" type="checkbox"/> Basis of the reportII <input type="checkbox"/> PriorityIII <input type="checkbox"/> Non-establishment of opinion with regard to novelty, inventive step and industrial applicabilityIV <input type="checkbox"/> Lack of unity of inventionV <input checked="" type="checkbox"/> Reasoned statement under Article 35(2) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statementVI <input type="checkbox"/> Certain documents citedVII <input type="checkbox"/> Certain defects in the international applicationVIII <input type="checkbox"/> Certain observations on the international application		
Date of submission of the demand 12/02/2001		Date of completion of this report 12.10.2001
Name and mailing address of the international preliminary examining authority:  European Patent Office D-80298 Munich Tel. +49 89 2399 - 0 Tx: 523656 epmu d Fax: +49 89 2399 - 4465		Authorized officer Noll, B Telephone No. +49 89 2399 8700 

INTERNATIONAL PRELIMINARY EXAMINATION REPORT

International application No. PCT/US99/30775

I. Basis of the report

1. With regard to the **elements** of the international application (*Replacement sheets which have been furnished to the receiving Office in response to an invitation under Article 14 are referred to in this report as "originally filed" and are not annexed to this report since they do not contain amendments (Rules 70.16 and 70.17)*):

Description, pages:

1,2,4-9 as originally filed

3,3a as received on 12/07/2001 with letter of 10/07/2001

Claims, No.:

1-11 as received on 12/07/2001 with letter of 10/07/2001

Drawings, sheets:

1/3-3/3 as originally filed

2. With regard to the **language**, all the elements marked above were available or furnished to this Authority in the language in which the international application was filed, unless otherwise indicated under this item.

These elements were available or furnished to this Authority in the following language: , which is:

- ☐ the language of a translation furnished for the purposes of the international search (under Rule 23.1(b)).
- ☐ the language of publication of the international application (under Rule 48.3(b)).
- ☐ the language of a translation furnished for the purposes of international preliminary examination (under Rule 55.2 and/or 55.3).

3. With regard to any **nucleotide and/or amino acid sequence** disclosed in the international application, the international preliminary examination was carried out on the basis of the sequence listing:

- ☐ contained in the international application in written form.
- ☐ filed together with the international application in computer readable form.
- ☐ furnished subsequently to this Authority in written form.
- ☐ furnished subsequently to this Authority in computer readable form.
- ☐ The statement that the subsequently furnished written sequence listing does not go beyond the disclosure in the international application as filed has been furnished.
- ☐ The statement that the information recorded in computer readable form is identical to the written sequence listing has been furnished.

4. The amendments have resulted in the cancellation of:

**INTERNATIONAL PRELIMINARY
EXAMINATION REPORT**

International application No. PCT/US99/30775

- ☐ the description, pages:
☐ the claims, Nos.:
☐ the drawings, sheets:

5. ☐ This report has been established as if (some of) the amendments had not been made, since they have been considered to go beyond the disclosure as filed (Rule 70.2(c)):

(Any replacement sheet containing such amendments must be referred to under item 1 and annexed to this report.)

6. Additional observations, if necessary:

V. Reasoned statement under Article 35(2) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement

1. Statement

Novelty (N)	Yes:	Claims	1-11
	No:	Claims	
Inventive step (IS)	Yes:	Claims	6-11
	No:	Claims	1-5
Industrial applicability (IA)	Yes:	Claims	1-11
	No:	Claims	

- 2. Citations and explanations
see separate sheet**

**INTERNATIONAL PRELIMINARY
EXAMINATION REPORT - SEPARATE SHEET**

International application No. PCT/US99/30775

To section V:

With regard to claim 1 the document JP-A-60 144857 (hereinafter referred to as D1) discloses an apparatus for isolating an external device 8 from noise. The apparatus includes a processor 2 for producing data (on D0 to D7) and clock signals (this is implicit) and a control signal 12, a bus 5 that couples the signals to a buffer 1, wherein the buffer selectively couples, in response to the control signal (i.e. through control circuit 14) the clock and data signals to respective inputs 6 of the external device 8.

The subject-matter of present claim 1 differs from that of D1 in that the device is operatively coupled to the processor only when the processor is communicating with the device whereas in D1 the device is only decoupled from the processor when the processor is communication with one of the memories 3, 4 over the bus. In this way, memory operation in D1 is protected from peripheral element noise. In contrast, the object of the present application is to prevent the external device from noise generated at the processor. A skilled person trying to find a solution for this problem would inevitably modify the buffer of the apparatus of D1 in such a manner that the external device is decoupled from the processor except during communication, in order to minimize negative effects of noise to the device. hence, the subject-matter of claim 1 is not based on an inventive step.

Claims 2 to 5 further claim that the bus is an IIC bus. This kind of bus is generally known in television receivers, see for example the documents WO-A-99 31598 (hereinafter referred to as D2). A skilled person would consider it as normal procedure to likewise apply the principle of isolating a noise sensitive device as described in D1 to an IIC bus system as described in D2. Therefore, claims 2-5 lack inventive step.

None of the available prior art discloses or renders obvious the subject-matter claimed in claim 6 which relates to a television receiver including a control and a front-end assembly and an AV processor. The front-end assembly comprises a tuner the PLL of which is coupled to an output of a buffer. so that the PLL is not permanently connected to the bus.

Dependent claims 7-11 relate to preferred embodiments of the invention. Hence claims 6-11 meet the requirements of Article 33(2)-(4) PCT.

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analog television signal, the IIC bus chatter will manifest itself as a distorted picture and/or undesirable wow and/or flutter in the audio output.

Phase noise interference, caused by the IIC bus traffic, may be compensated somewhat by widening the bandwidth of the demodulation IC's carrier tracking-loop, to allow it to "track out" the corruption. However, such a method allows additional low frequency noise to combine with the video/audio signal, thereby degrading the bit error rate of the television receiver.

Thus, there is a need to reduce the IIC bus chatter created by the IC traffic on the IIC bus. Furthermore, there is a need to reduce the IIC bus chatter before it influences the phase-lock loop circuitry of the tuner.

JP-A-60 144857 discloses an arrangement that seeks to isolate a peripheral element from a CPU and a plurality of memory elements to prevent interference from the peripheral element from causing erroneous data to be written into or read from the memory. In this case the concern arises from the operation of the peripheral element causing interference with the operation of the CPU and the memory elements. To achieve this goal, JP-A-60 144857 discloses a bus buffer control circuit that isolates the peripheral element when a peripheral access signal is enabled and the memory elements are being accessed. However, the peripheral element remains operatively coupled to the microprocessor via the digital bus when the memory elements are not being accessed, and as such, is not isolated from potential interference from the operation of the microprocessor.

SUMMARY OF INVENTION

The disadvantages heretofore associated with the prior art, are overcome by the present invention of a method and apparatus for isolating a noise intolerant device, e.g., a phase-lock loop of a tuner within a television receiver, from source of noise. In one embodiment, the apparatus isolates a phase-lock loop integrated circuit (IC) from the bus, by providing an isolation buffer that allows the receiver to only pass data to the tuner's phase-lock loop IC when a tune command is issued by a processor.

When not being tuned, the IIC lines to the tuner are held HIGH by a buffer until needed again to perform the tuning function. This allows the demodulation circuitry to use a setting for a carrier tracking-loop that optimizes bit error rate performance.

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BRIEF DESCRIPTION OF THE DRAWINGS

The teachings of the present invention can be readily understood by considering the following detailed description in conjunction with the accompanying drawings, in which:

FIGS. 1A and 1B depict a block diagram of a portion of a television receiver
5 comprising a buffer for an IIC bus; and

FIG. 2 depicts a flow diagram of a method for isolating the tuner from the controller assembly in accordance with the present invention.

CLAIMS

1. An apparatus for isolating a noise intolerant device (140) from a source of noise, comprising:

5 a processor (106) for producing clock and data signals (SCL, SDA) and a control signal; and

a digital bus (118) that couples said clock and data signals to a buffer (114),

where, in response to said control signal (109), said buffer selectively couples said clock and data signals to respective clock and data inputs of said noise intolerant device such
10 that said noise intolerant device is operatively coupled to said processor via said digital bus only when said processor is communicating with said noise intolerant device.

2. The apparatus of claim 1, wherein said digital bus is an inter integrated circuit (IIC) bus, and the apparatus further comprises an IIC bus expander (108) for transferring said
15 control signal to said buffer.

3. The apparatus of claim 1, wherein the digital bus comprises
an IIC bus having a clock signal path (SCL) for transferring clock pulses from said processor (106) to said clock inputs of said IIC bus expander (108) and said buffer (114);

20 a data signal path (SDA) for transferring data from said processor (106) on said data signal path during each of said clock pulses on said clock signal path to said clock and data inputs of said IIC bus expander (108) and said buffer (114); and

wherein, said output of said IIC bus expander, coupled to said buffer, selectively controls a clock output and a data output of said buffer for isolating said noise intolerant
25 device (140) from said IIC bus and said processor.

4. The apparatus of claim 3, wherein said noise intolerant device comprises:

a tuner (140), coupled to said clock and data outputs of said buffer device, having a phase-lock (142) loop for generating frequency variable tones, and a down-converter (144)

30 coupled, to said phase-lock loop, for mixing one of a plurality of television signals with a one of said frequency variable tones to produce an IF television signal.

5. The apparatus of claim 4, wherein said buffer (144) comprises:
a first OR gate (116) and a second OR gate (117), each of said first and said second OR gates having a first input (116₁, 117₁) coupled to said output of said IIC bus expander;
5 a second input (116₂) said first OR gate coupled to a clock signal path of said IIC bus, and a second input (117₂) of said second OR gate coupled to a data signal path of said IIC bus; and
an output (116₃) of said first OR gate, being said clock output of said buffer, coupled to said clock input of said phase-lock loop (142), and an output (117₃) of said second OR
10 gate, being said data output of said buffer, coupled to said data input of said phase-lock loop (142).
6. A television receiver (100) for receiving and processing television signals, apparatus comprising:
15 a controller-assembly (102) comprising an inter-integrated circuit (IIC) bus having a clock signal path (110) and a data signal path (112), a processor (106), coupled to said clock and data paths, an IIC bus expander (109) coupled to said processor via said clock and data paths, and a buffer (114) coupled to an output of said IIC bus expander;
a front-end assembly (130) comprising a tuner (140) having a down converter (144)
20 coupled to a phase-lock loop (142), said phase-lock loop coupled to an output of said buffer (114), at least one demodulator (131, 132) for demodulating said television signals, coupled to said down-converter, such that said noise intolerant device is operatively coupled to said processor via said digital bus only when said processor is communicating with said noise intolerant device; and
25 at least one video and audio processor (122, 124) for processing said modulated television signals to produce audio and video signals.

7. The apparatus of claim 6, wherein said buffer comprises:

a first OR gate (116) and a second OR gate (117), each of said first and said second OR gates having a first input (116₁, 117₁) coupled to said output of said IIC bus expander;

5 a second input (116₂) of said first OR gate coupled to said clock signal path of said IIC bus, and a second input (117₂) of said second OR gate coupled to said data signal path of said IIC bus; and

an output (116₃) of said first OR gate, being said clock output of said buffer, coupled to said clock input of said phase-lock loop (143), and an output (117₃) of said second OR
10 gate, being said data output of said buffer (114), coupled to said data input of said phase-lock loop.

8. A method for isolating a phase-lock loop in a tuner of a television receiver, comprising the steps of:

15 sending (208) a first command from a processor to a phase-lock loop via a digital bus to generate a frequency tone; and

sending (210) a second command to a buffer to isolate said phase-lock loop from said processor, whereby said noise intolerant device is operatively coupled to said processor via said digital bus only when said processor is communicating with said noise intolerant device

20

9. The method of claim 8, wherein said first command sending step further comprises the steps of:

setting an inter-integrated circuit (IIC) bus expander output to a LOW logical state, after receiving a request for a selected television signal from a user, in response to said first
25 command by said processor; and

coupling said phase-lock loop to an IIC bus, for enabling said processor to communicate with said phase-lock loop to generate said frequency tone.

10. The method of claim 9 wherein said coupling step further comprises the step
30 of:

enabling, in response bus expander output, a buffer to couple said phase-lock loop to said IIC bus.

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11. The method of claim 9, wherein said second command sending step further comprises the step of:

setting an output of said buffer to a HIGH logical state after said phase-lock loop locks to said single frequency tone, in response to said second command from said processor.

5

PATENT COOPERATION TREATY

PCT

INTERNATIONAL PRELIMINARY EXAMINATION REPORT

(PCT Article 36 and Rule 70)

Applicant's or agent's file reference RCA89647	<div style="display: flex; justify-content: space-between;"> <div> FOR FURTHER ACTION </div> <div> See Notification of Transmittal of International Preliminary Examination Report (Form PCT/IPEA/416) </div> </div>	
International application No. PCT/US99/30775	International filing date (day/month/year) 22/12/1999	Priority date (day/month/year) 15/07/1999
International Patent Classification (IPC) or national classification and IPC H04N5/44		
Applicant THOMSON LICENSING S.A. et al.		
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<p>3. This report contains indications relating to the following items:</p> <ul style="list-style-type: none"> I <input checked="" type="checkbox"/> Basis of the report II <input type="checkbox"/> Priority III <input type="checkbox"/> Non-establishment of opinion with regard to novelty, inventive step and industrial applicability IV <input type="checkbox"/> Lack of unity of invention V <input checked="" type="checkbox"/> Reasoned statement under Article 35(2) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement VI <input type="checkbox"/> Certain documents cited VII <input type="checkbox"/> Certain defects in the international application VIII <input type="checkbox"/> Certain observations on the international application 		
Date of submission of the demand 12/02/2001	Date of completion of this report 12.10.2001	
Name and mailing address of the international preliminary examining authority: <div style="display: flex; align-items: center;"> <div> European Patent Office D-80298 Munich Tel. +49 89 2399 - 0 Tx: 523656 epmu d Fax: +49 89 2399 - 4465 </div> </div>	Authorized officer Noll, B Telephone No. +49 89 2399 8700	



**INTERNATIONAL PRELIMINARY
EXAMINATION REPORT**

International application No. PCT/US99/30775

I. Basis of the report

1. With regard to the **elements** of the international application (*Replacement sheets which have been furnished to the receiving Office in response to an invitation under Article 14 are referred to in this report as "originally filed" and are not annexed to this report since they do not contain amendments (Rules 70.16 and 70.17)*):

Description, pages:

1,2,4-9	as originally filed			
3,3a	as received on	12/07/2001	with letter of	10/07/2001

Claims, No.:

1-11	as received on	12/07/2001	with letter of	10/07/2001
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Drawings, sheets:

1/3-3/3	as originally filed
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2. With regard to the **language**, all the elements marked above were available or furnished to this Authority in the language in which the international application was filed, unless otherwise indicated under this item.

These elements were available or furnished to this Authority in the following language: , which is:

- ☐ the language of a translation furnished for the purposes of the international search (under Rule 23.1(b)).
- ☐ the language of publication of the international application (under Rule 48.3(b)).
- ☐ the language of a translation furnished for the purposes of international preliminary examination (under Rule 55.2 and/or 55.3).

3. With regard to any **nucleotide and/or amino acid sequence** disclosed in the international application, the international preliminary examination was carried out on the basis of the sequence listing:

- ☐ contained in the international application in written form.
- ☐ filed together with the international application in computer readable form.
- ☐ furnished subsequently to this Authority in written form.
- ☐ furnished subsequently to this Authority in computer readable form.
- ☐ The statement that the subsequently furnished written sequence listing does not go beyond the disclosure in the international application as filed has been furnished.
- ☐ The statement that the information recorded in computer readable form is identical to the written sequence listing has been furnished.

4. The amendments have resulted in the cancellation of:

**INTERNATIONAL PRELIMINARY
EXAMINATION REPORT**

International application No. PCT/US99/30775

- ☐ the description, pages:
☐ the claims, Nos.:
☐ the drawings, sheets:

5. ☐ This report has been established as if (some of) the amendments had not been made, since they have been considered to go beyond the disclosure as filed (Rule 70.2(c)):

(Any replacement sheet containing such amendments must be referred to under item 1 and annexed to this report.)

6. Additional observations, if necessary:

V. Reasoned statement under Article 35(2) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement

1. Statement

Novelty (N)	Yes:	Claims	1-11
	No:	Claims	
Inventive step (IS)	Yes:	Claims	6-11
	No:	Claims	1-5
Industrial applicability (IA)	Yes:	Claims	1-11
	No:	Claims	

- 2. Citations and explanations**
see separate sheet

**INTERNATIONAL PRELIMINARY
EXAMINATION REPORT - SEPARATE SHEET**

International application No. PCT/US99/30775

To section V:

With regard to claim 1 the document JP-A-60 144857 (hereinafter referred to as D1) discloses an apparatus for isolating an external device 8 from noise. The apparatus includes a processor 2 for producing data (on D0 to D7) and clock signals (this is implicit) and a control signal 12, a bus 5 that couples the signals to a buffer 1, wherein the buffer selectively couples, in response to the control signal (i.e. through control circuit 14) the clock and data signals to respective inputs 6 of the external device 8.

The subject-matter of present claim 1 differs from that of D1 in that the device is operatively coupled to the processor only when the processor is communicating with the device whereas in D1 the device is only decoupled from the processor when the processor is communication with one of the memories 3, 4 over the bus. In this way, memory operation in D1 is protected from peripheral element noise. In contrast, the object of the present application is to prevent the external device from noise generated at the processor. A skilled person trying to find a solution for this problem would inevitably modify the buffer of the apparatus of D1 in such a manner that the external device is decoupled from the processor except during communication, in order to minimize negative effects of noise to the device. hence, the subject-matter of claim 1 is not based on an inventive step.

Claims 2 to 5 further claim that the bus is an IIC bus. This kind of bus is generally known in television receivers, see for example the documents WO-A-99 31598 (hereinafter referred to as D2). A skilled person would consider is as normal procedure to likewise apply the principle of isolating a noise sensitive devise as described in D1 to an IIC bus system as described in D2. Therefore, claims 2-5 lack inventive step.

None of the available prior art discloses or renders obvious the subject-matter claimed in claim 6 which relates to a television receiver including a control and a front-end assembly and an AV processor. The front-end assembly comprises a tuner the PLL of which is coupled to an output of a buffer. so that the PLL is not permanently connected to the bus.

Dependent claims 7-11 relate to preferred embodiments of the invention. Hence claims 6-11 meet the requirements of Article 33(2)-(4) PCT.

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analog television signal, the IIC bus chatter will manifest itself as a distorted picture and/or undesirable wow and/or flutter in the audio output.

Phase noise interference, caused by the IIC bus traffic, may be compensated somewhat by widening the bandwidth of the demodulation IC's carrier tracking-loop, to allow it to "track out" the corruption. However, such a method allows additional low frequency noise to combine with the video/audio signal, thereby degrading the bit error rate of the television receiver.

Thus, there is a need to reduce the IIC bus chatter created by the IC traffic on the IIC bus. Furthermore, there is a need to reduce the IIC bus chatter before it influences the phase-lock loop circuitry of the tuner.

JP-A-60 144857 discloses an arrangement that seeks to isolate a peripheral element from a CPU and a plurality of memory elements to prevent interference from the peripheral element from causing erroneous data to be written into or read from the memory. In this case the concern arises from the operation of the peripheral element causing interference with the operation of the CPU and the memory elements. To achieve this goal, JP-A-60 144857 discloses a bus buffer control circuit that isolates the peripheral element when a peripheral access signal is enabled and the memory elements are being accessed. However, the peripheral element remains operatively coupled to the microprocessor via the digital bus when the memory elements are not being accessed, and as such, is not isolated from potential interference from the operation of the microprocessor.

SUMMARY OF INVENTION

The disadvantages heretofore associated with the prior art, are overcome by the present invention of a method and apparatus for isolating a noise intolerant device, e.g., a phase-lock loop of a tuner within a television receiver, from source of noise. In one embodiment, the apparatus isolates a phase-lock loop integrated circuit (IC) from the bus, by providing an isolation buffer that allows the receiver to only pass data to the tuner's phase-lock loop IC when a tune command is issued by a processor.

When not being tuned, the IIC lines to the tuner are held HIGH by a buffer until needed again to perform the tuning function. This allows the demodulation circuitry to use a setting for a carrier tracking-loop that optimizes bit error rate performance.

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BRIEF DESCRIPTION OF THE DRAWINGS

The teachings of the present invention can be readily understood by considering the following detailed description in conjunction with the accompanying drawings, in which:

FIGS. 1A and 1B depict a block diagram of a portion of a television receiver
5 comprising a buffer for an IIC bus; and

FIG. 2 depicts a flow diagram of a method for isolating the tuner from the controller assembly in accordance with the present invention.

PATENT COOPERATION TREATY

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INTERNATIONAL PRELIMINARY EXAMINING AUTHORITY

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NOTIFICATION OF TRANSMITTAL OF
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Applicant

THOMSON LICENSING S.A. et al.

1. The applicant is hereby notified that this International Preliminary Examining Authority transmits herewith the international preliminary examination report and its annexes, if any, established on the international application.
2. A copy of the report and its annexes, if any, is being transmitted to the International Bureau for communication to all the elected Offices.
3. Where required by any of the elected Offices, the International Bureau will prepare an English translation of the report (but not of any annexes) and will transmit such translation to those Offices.

4. REMINDER

The applicant must enter the national phase before each elected Office by performing certain acts (filing translations and paying national fees) within 30 months from the priority date (or later in some Offices) (Article 39(1)) (see also the reminder sent by the International Bureau with Form PCT/IB/301).

Where a translation of the international application must be furnished to an elected Office, that translation must contain a translation of any annexes to the international preliminary examination report. It is the applicant's responsibility to prepare and furnish such translation directly to each elected Office concerned.

For further details on the applicable time limits and requirements of the elected Offices, see Volume II of the PCT Applicant's Guide.

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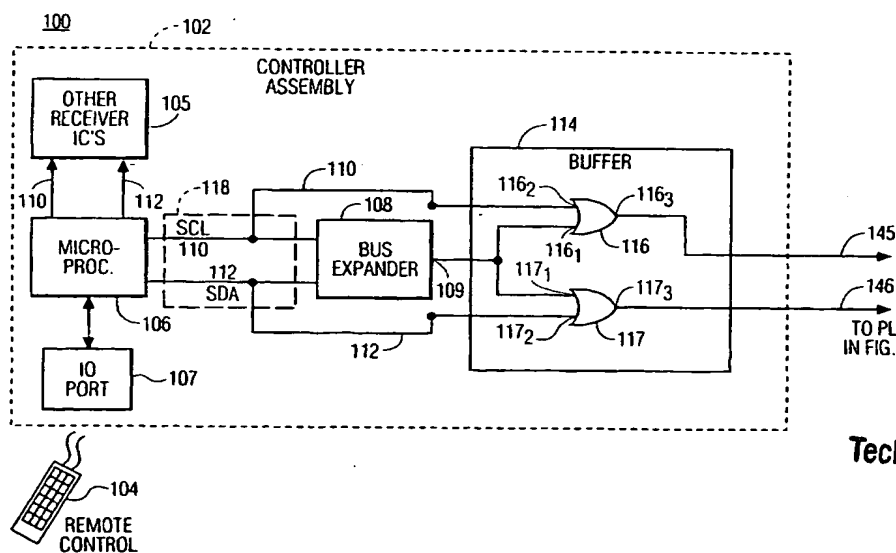
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(54) Title: METHOD AND APPRATUS FOR ISOLATING IIC BUS NOISE FROM A TUNER IN A TELEVISION RECEIVER



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(57) Abstract: A method and apparatus for isolating a noise intolerant device, e.g., a phase-lock loop of a tuner within a television receiver, from source of noise. In one embodiment, the apparatus isolates a phase-lock loop integrated circuit (IC) from the bus, by providing an isolation buffer that allows the receiver to only pass data to the tuner's phase-lock loop IC when a tune command is issued by a processor. When not being tuned, the IIC lines to the tuner are held HIGH by a buffer until needed again to perform the tuning function. This allows the demodulation circuitry to use a setting for a carrier tracking-loop that optimizes bit error rate performance.

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